

Massachusetts Division of Marine Fisheries



Gear Characteristics Survey

Bill Hoffman

Aquatic Biologist

Rebecca Jones

Fisheries Supervisor

Dan McKiernan

Assistant Director

Gear Characteristics Survey

Goal:

- Characterize fixed gear configurations used in coastal and near coastal waters by Massachusetts fishing vessels.



Survey Design

- **Identified fixed gear fisheries to be surveyed**
- **Identified current fishing vessels of the fixed gear fisheries**
- **Categorized vessels by reported amount of gear fished annually**
- **Established geographic areas**
- **Randomly selected survey participants**

Selected Fisheries

- **Lobster**
- **Sink Gillnet**
- **Hagfish**
- **Tub Trawl/Longline**
- **Fish Pot**

Massachusetts Division of Marine Fisheries
Fisheries Dependent Investigations
FIXED GEAR CHARACTERISTICS SURVEY
HAGFISH FISHERY



F/V _____

POT CHARACTERISTICS

SHAPE	SIZE	DIMENSIONS	
Unknown 0 _____	Unknown 0 _____	Length _____ in	Width _____ in
Rectangular 1 _____	20gal 1 _____	Top _____ in	_____ in
Round/Oval 2 _____	30gal 2 _____	Bottom _____ in	_____ in
1/2 Round 3 _____	40gal 3 _____	Height _____ in	_____ in
Other 9 _____	45gal 4 _____	_____ in	_____ in
	50gal 5 _____	Diameter _____ in	Height _____ in
	55gal 6 _____	_____ in	_____ in
	60gal 7 _____	_____ in	_____ in
	65gal 8 _____	_____ in	_____ in
SIDE CONSTRUCTION	Other 9 _____		
Unknown 0 _____			
Plastic 1 _____			
Other 9 _____			

POT WEIGHT _____ lbs

BRIDLE

MATERIAL	
Nylon 1 _____	Rag rope 4 _____
Poly 2 _____	Combination 8 _____
Neutral buoyant 3 _____	Other 9 _____
LENGTH _____ in	
SIZE LINE _____ mm or in (circle one)	

ESCAPE VENT

USED? NO 0 _____ YES 1 _____	LENGTH _____ in	LOCATION	SHAPE
		Unknown 0 _____	Unknown 0 _____
	HEIGHT _____ in	Top 1 _____	Rectangular 1 _____
		Side 2 _____	Round/Oval 2 _____
NUMBER _____		Bottom 3 _____	Other 9 _____
or DIAMETER _____ in		Combination 8 _____	
		Other 9 _____	

GROUND LINE

TRAWLS? NO 0 _____ YES 1 _____	MATERIAL
	Nylon 1 _____
	Poly 2 _____
NUMBER POTS/TRAWL _____	Neutral buoyant 3 _____
	Rag rope 4 _____
	Combination 8 _____
	Other 9 _____
DISTANCE BETWEEN POTS _____ ft	float or sink
SIZE LINE _____ mm or in (circle one)	
SINGLES? NO 0 _____ YES 1 _____	RE-ATTACHMENT METHOD
	Knot 1 _____
	Splice 2 _____
	Other 9 _____
NUMBER _____	
How often do change ground line? _____ /week	
How often are you set over in a week? _____ /week	

GANGION

LENGTH _____ ft	ATTACH POT
	knot 1 _____
	Splice 2 _____
	Clip 3 _____
	Other 9 _____
MATERIAL	
Nylon 1 _____	
Poly 2 _____	
Neutral buoyant 3 _____	
Rag rope 4 _____	
Combination 8 _____	
Other 9 _____	
SIZE LINE _____ mm or in (circle one)	

END LINE

HIGHFLYER? NO 0 _____ YES 1 _____	MATERIAL	SIZE
RADAR REFLECTOR? NO 0 _____ YES 1 _____	Nylon 1 _____	
POLYBALL? NO 0 _____ YES 1 _____	Poly 2 _____	_____ mm or in (circle one)
SHAPE	Neutral buoyant 3 _____	
SIZE	Rag rope 4 _____	
Round 1 _____ in	Combination 8 _____	
Oval 2 _____	Other 9 _____	
Other 9 _____		
WEAK LINK USED? NO 0 _____ YES 1 _____		
float or sink	STYLE	
BUOY? NO 0 _____ YES 1 _____	Hoggrings 1 _____	
SIZE	Thin line 2 _____	
NUMBER	Swivel 3 _____	
5inx11in 1 _____	Slot Link 4 _____	
6inx14in 2 _____	Modern Mold Slip Link 5 _____	
7inx15in 3 _____	Other 9 _____	
9inx11in 4 _____		
Other 9 _____ in		
RE-ATTACHMENT METHOD		
Knot 1 _____		
Splice 2 _____		
Other 9 _____		
ATTACH TO BUOY?		
Knot 1 _____		
Splice 2 _____		
Other 9 _____		
SWIVEL NO 0 _____ YES 1 _____	How often do change end line? _____ /week	
If "yes" where? _____	How often are you set over in a week? _____ /week	

TRIPS / MONTH	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
AVG. SOAK												
AVG. DEPTH												
AVG. # POTS FISHED/TRIP												
GENERAL LOCATION												

COMMENTS:

OFFICE USE ONLY

Capt name: _____
 PH #: _____
 Date called: _____

Gear Survey Details

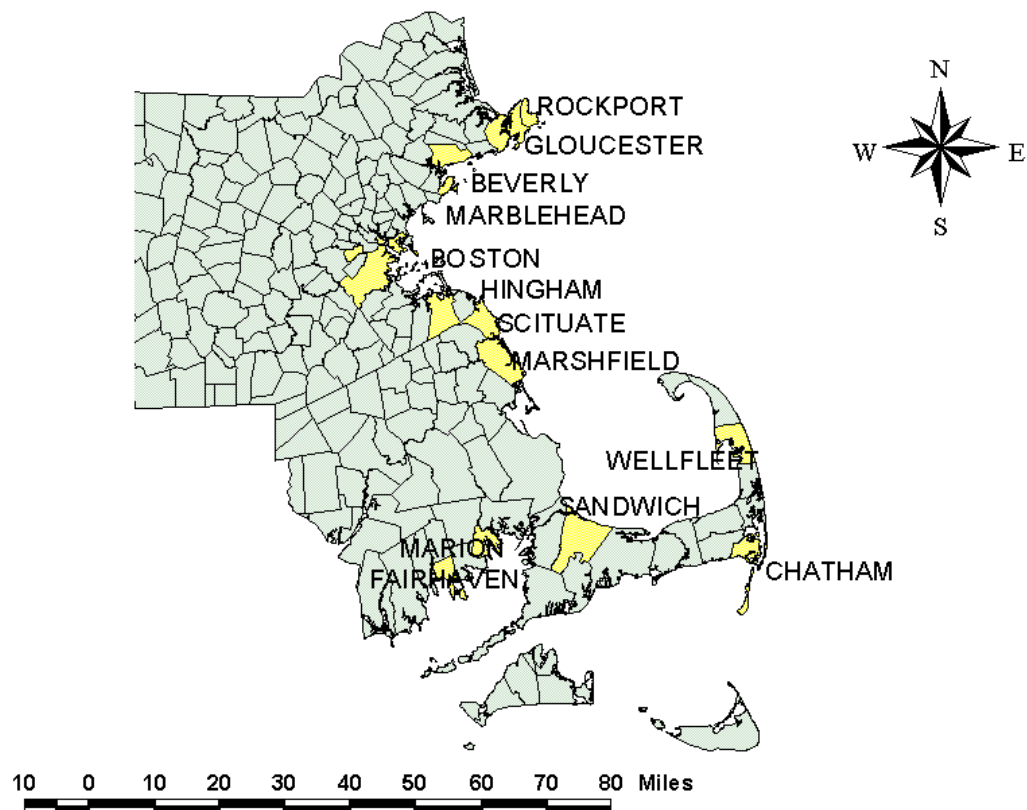
- Surveyed 64 fishermen
- Interviews conducted by DMF biologists and sea samplers
- Interviews via telephone, dockside, and at sea
- Lots of variability

LOBSTER FISHERY

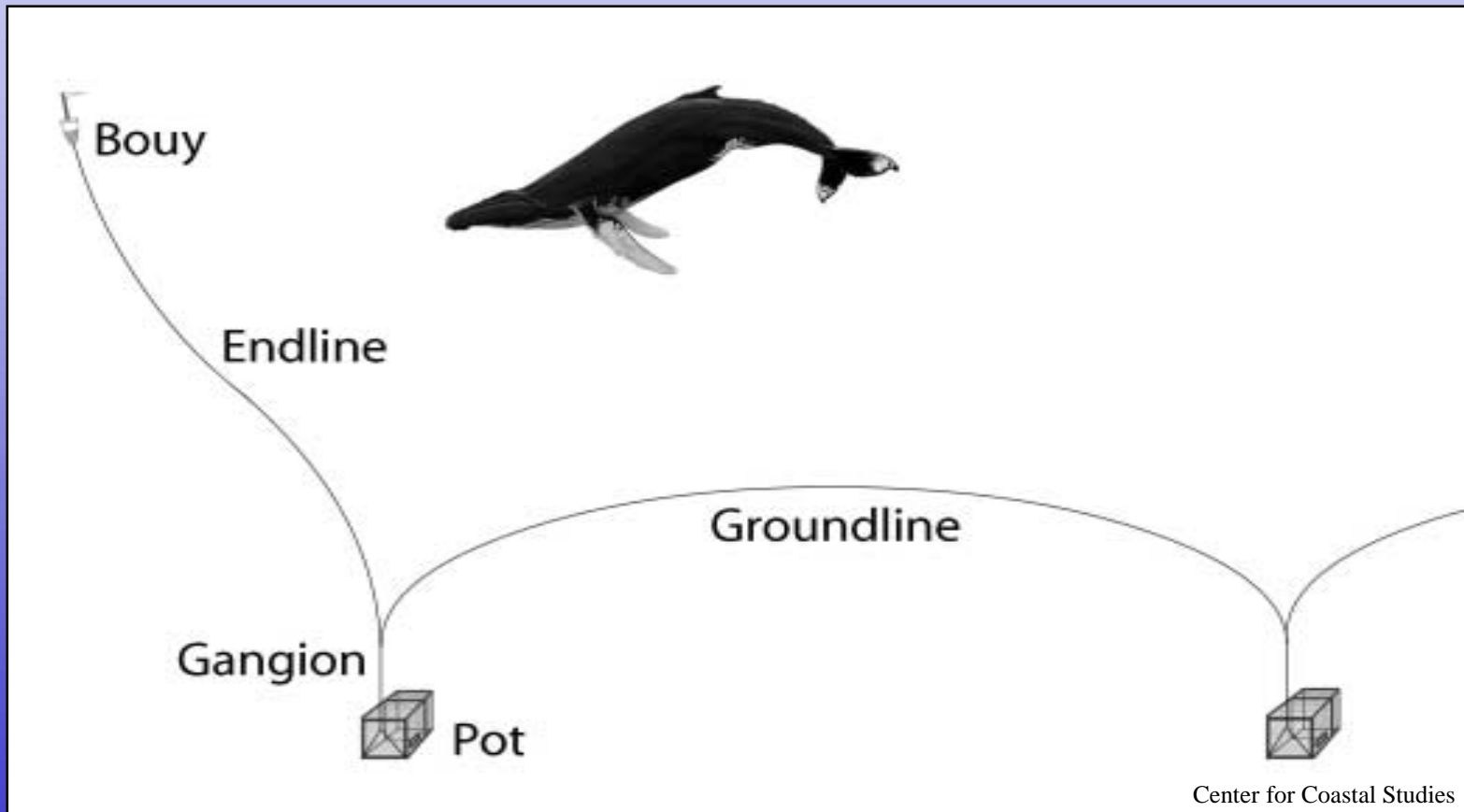
- **25 interviews**
- **Established 3 geographic areas**
 - **North Shore**
 - **South Shore/Cape Cod Bay**
 - **Outer Cape/ Southern Ma. and Islands**

Lobster Fishery - Ports Surveyed

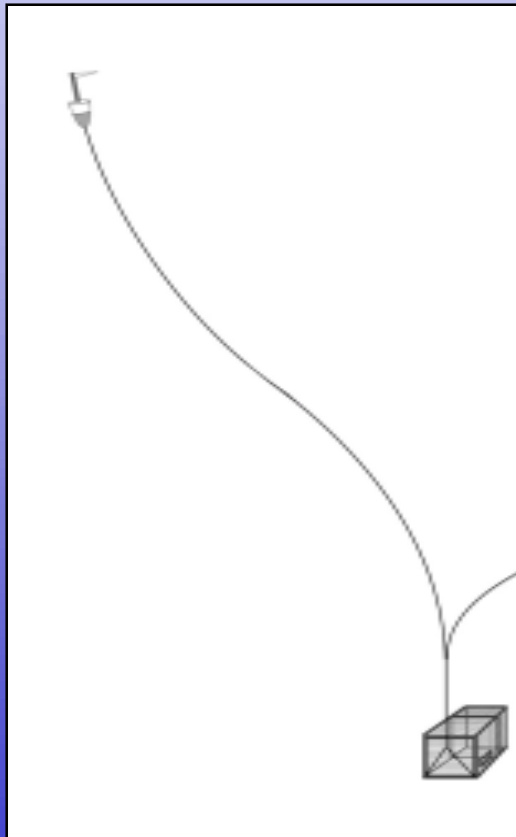
Lobster Ports



Lobster Trawl

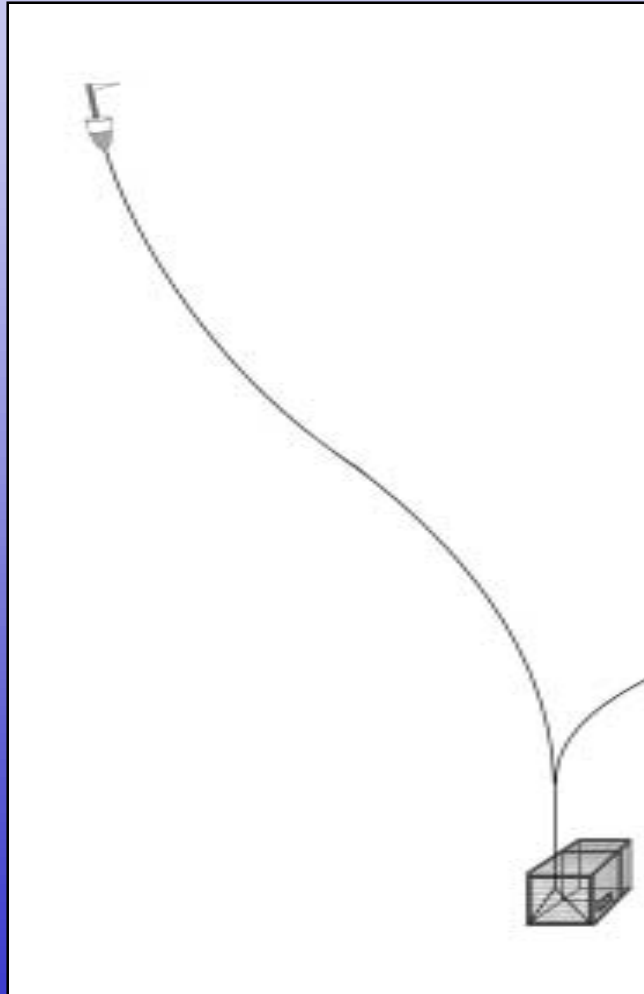


Lobster Buoys & Highfliers



- Use Highflier?
 - No: 55%
- Use Polyball?
 - No: 79%
 - 30": 83%
- Use a Bouy?
 - Yes: 60%
 - 7"x15"
- Attach to Buoy?
 - Knot: 80%

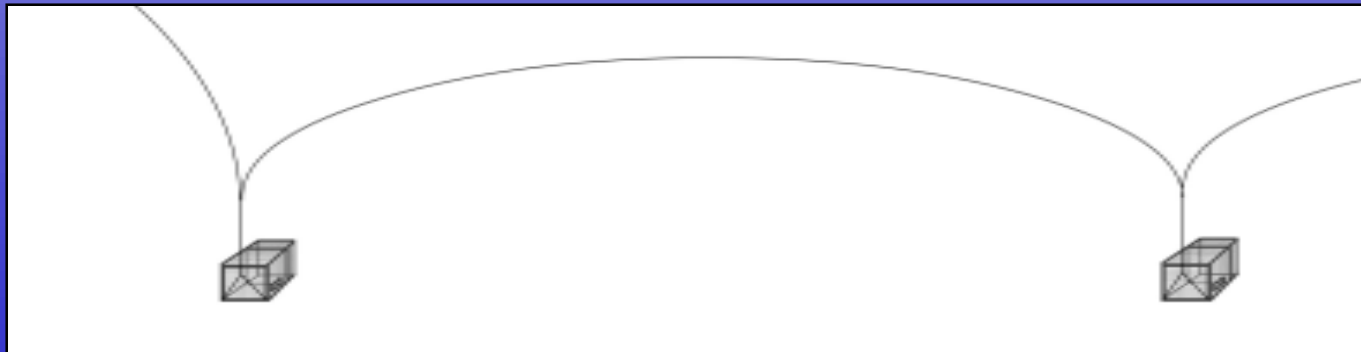
Lobster Endline Material:



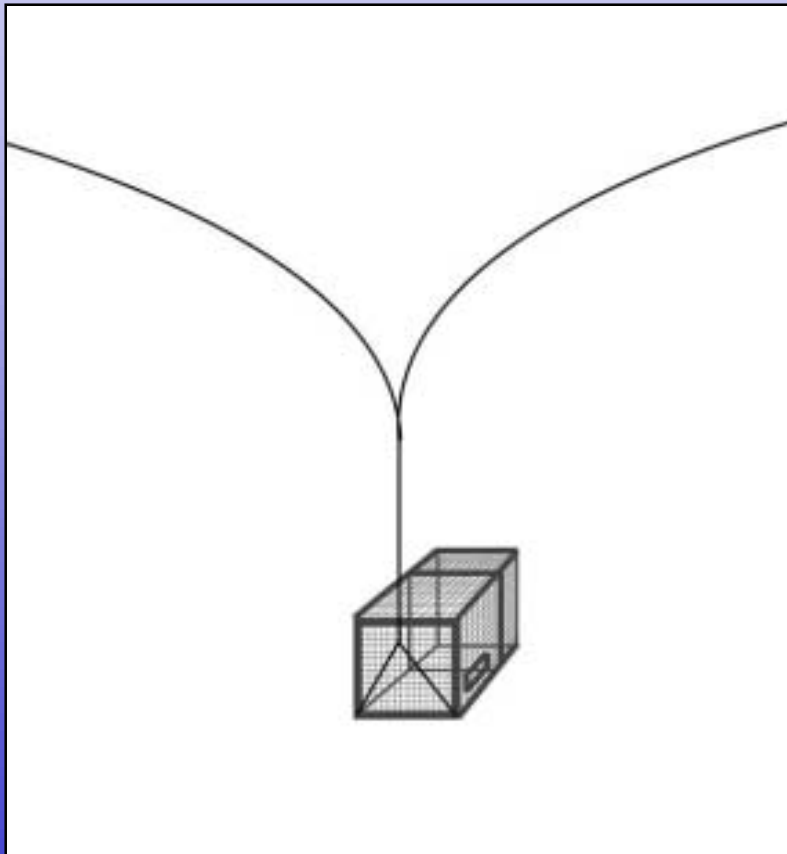
- 42% use combination of rope materials
 - 1/2 nylon and 1/2 poly: 28%
- Most common:
 - 5/16: 39%
- Weaklink:
 - Yes: 46%
 - 5 hogring
 - 500pound breaking strength
 - whales and ships

Lobster Groundline

- 92% fish trawls
 - 10 pot trawls
 - 48% have 81-110 feet between pots
- 50% fished 3/8 line
- Reattach w/ knot
 - Splice line at end of year

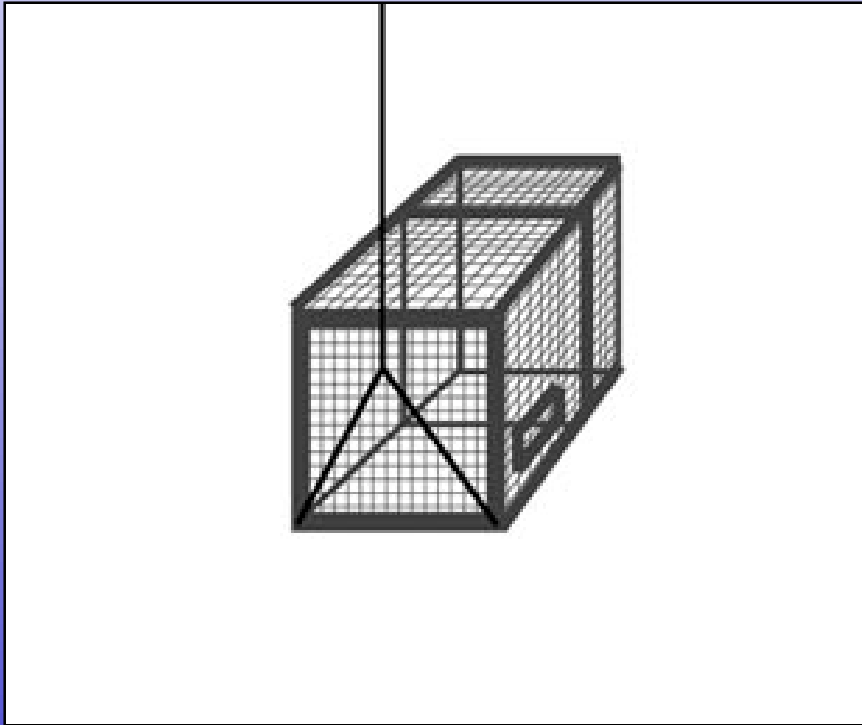


Lobster Gangion & Bridle



- 84% use Gangion
 - 38% at 2-3 feet long
 - 57% use nylon
 - 50% use 3/8" size rope
- 48% use 12" long bridle
 - 50% use 3/8" size rope
 - 47% use poly

Lobster Pot Characteristics

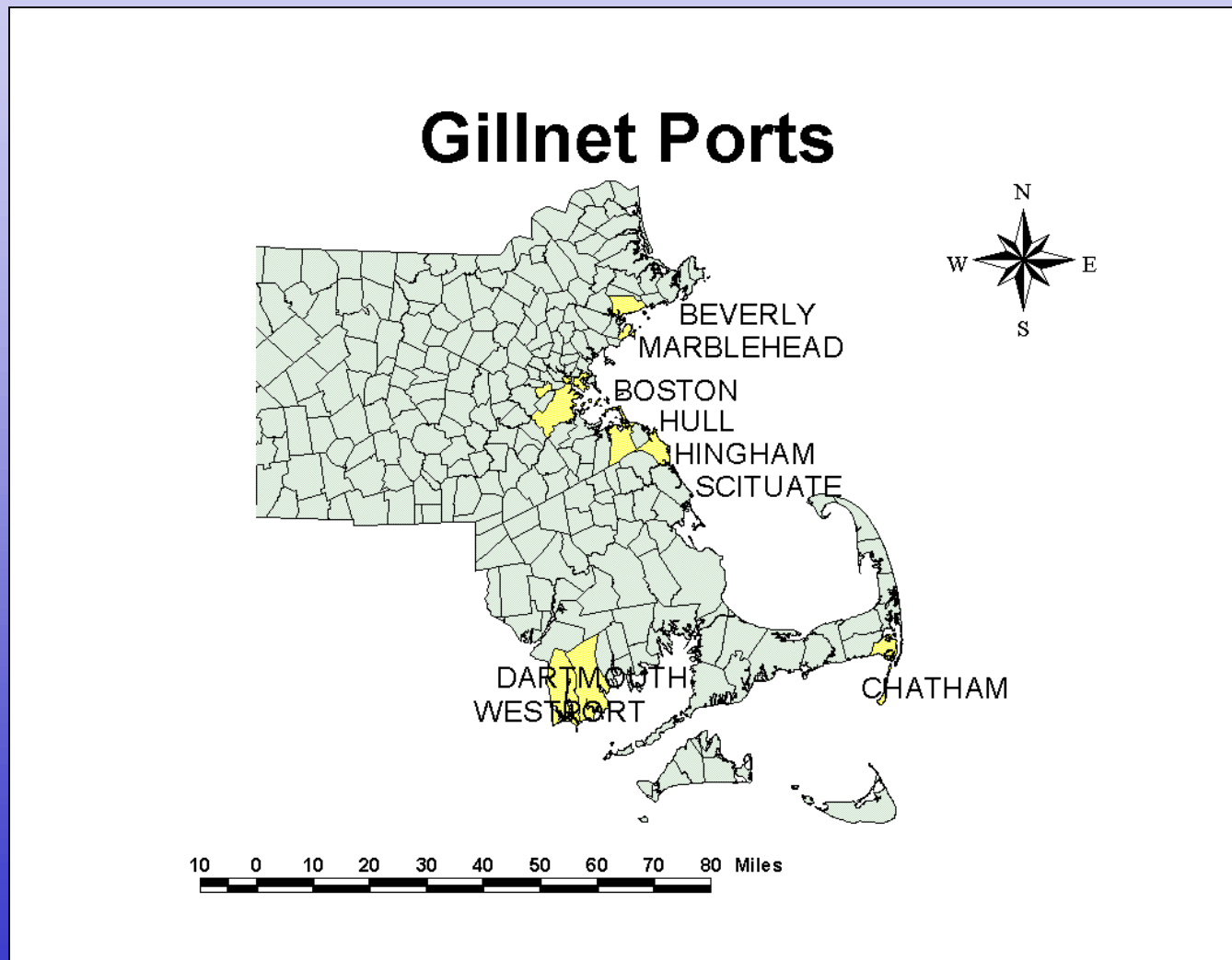


- Shape
 - 92% rectangular
- Side Construction
 - 87% coated wire
- Common Size:
 - 36"x21"
 - 13.5"

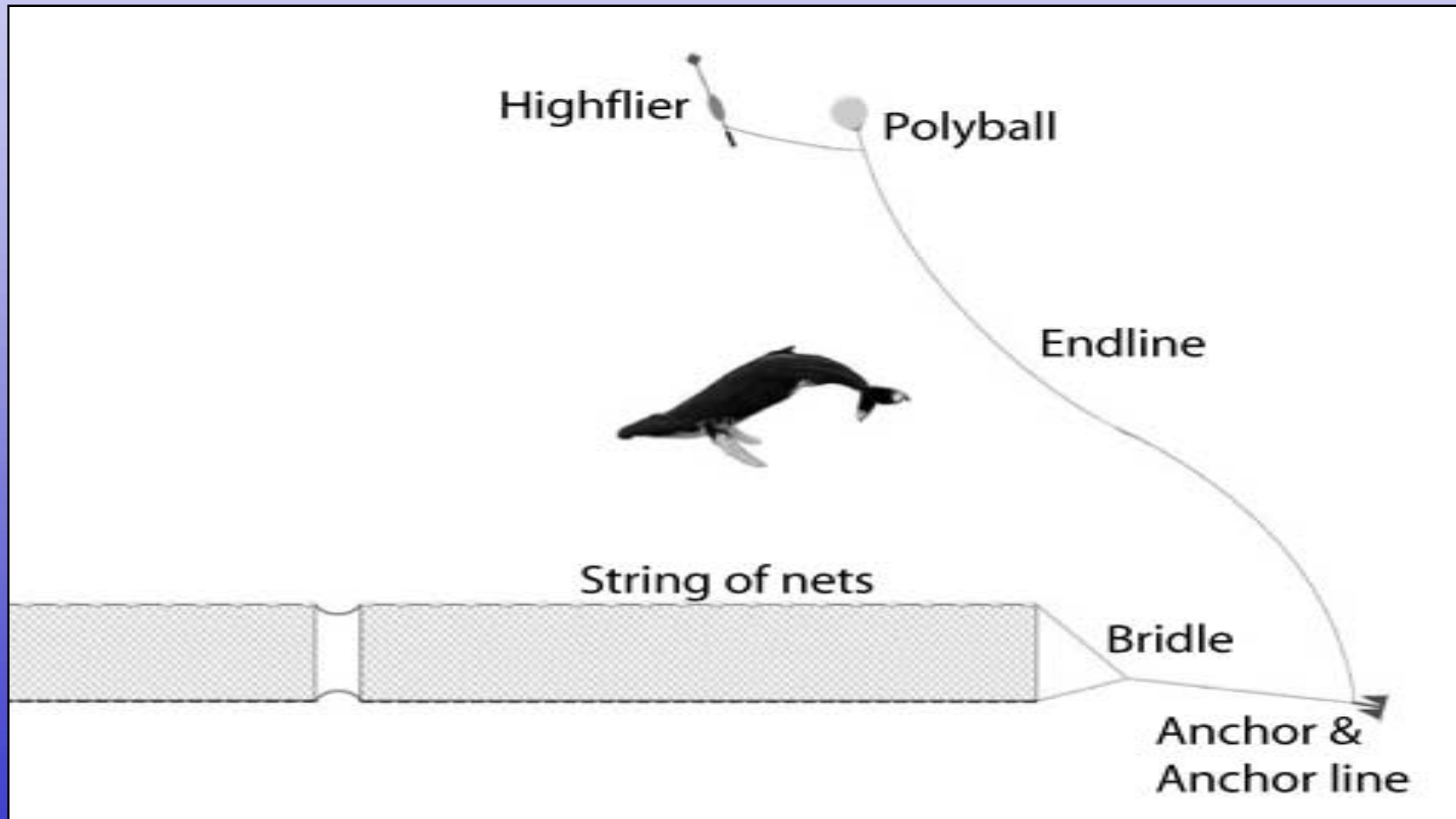
Sink Gillnet Fishery

- **15 boats interviewed**
- **Highly regulated fishery**
- **Many standard characteristics**
- **inshore vs. “near-shore”**

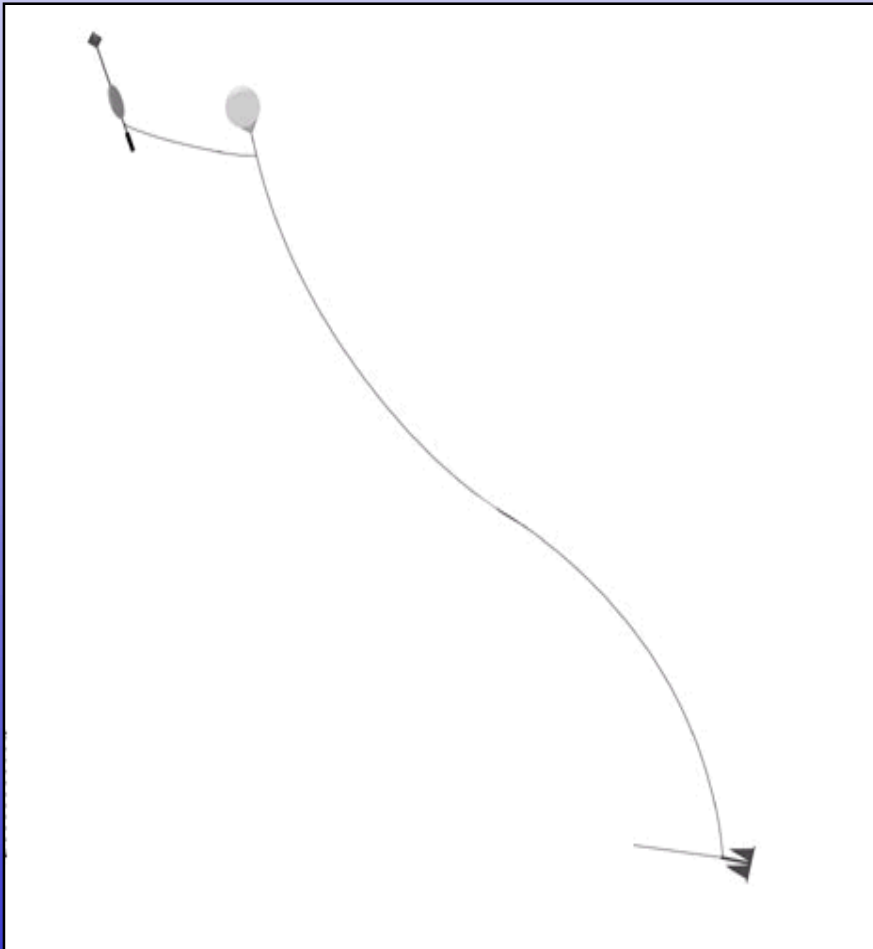
Gillnet Fishery - Ports Surveyed



Gillnet Gear

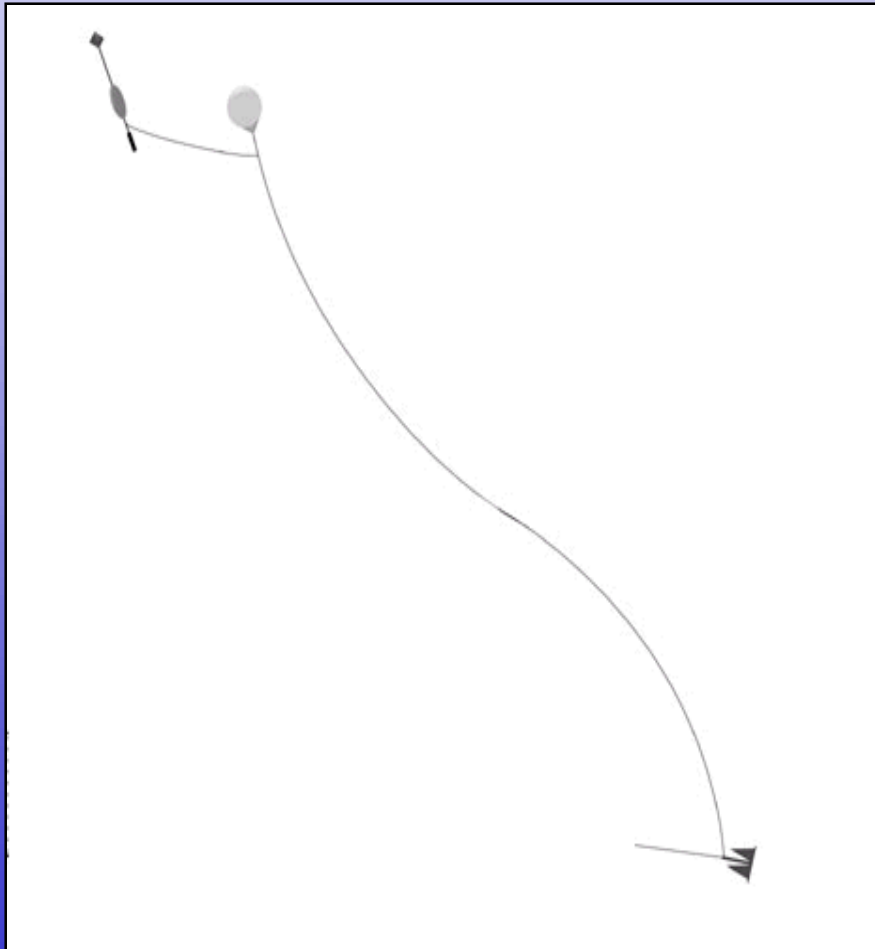


Gillnet Buoy and Highfliers



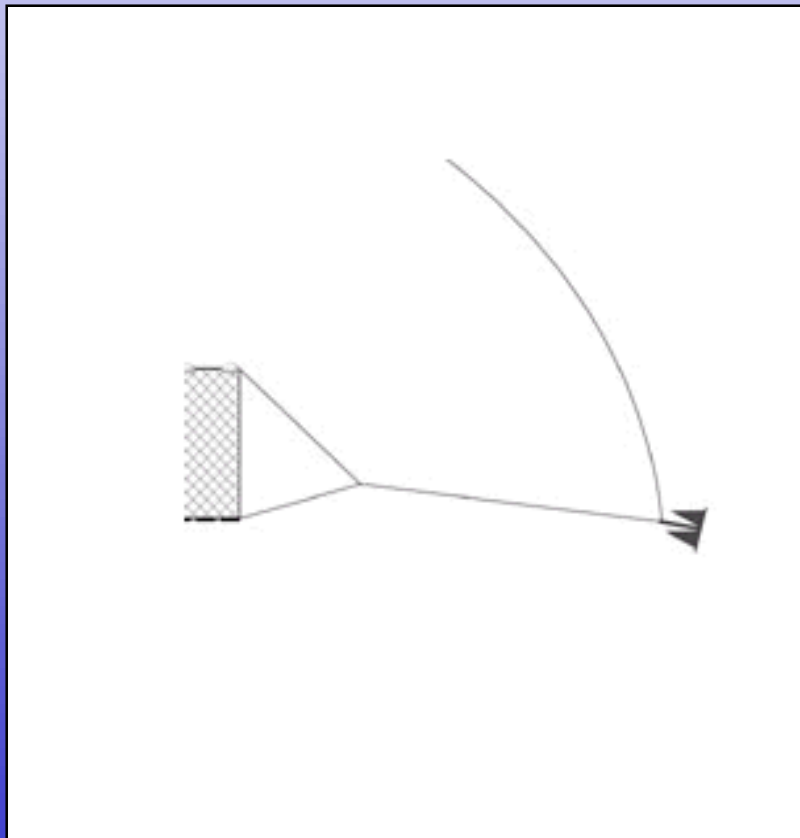
- Highflier:
 - yes: 100%
- Distance buoy to Highflier:
 - 3' to 24'
 - 12' most common
- Buoy or Polyball:
 - 73% Buoy
 - 7"x15"
 - 47% Polyball
 - 40"

Gillnet Endlines



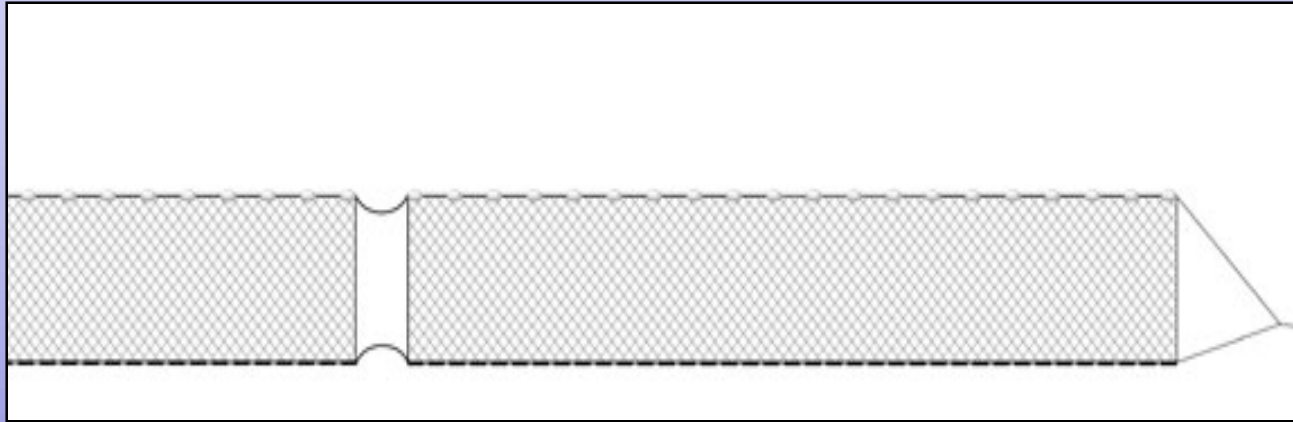
- Nylon/Poly comb:
 - yes: 44%
 - 3/8 line most common
 - 1/3 nylon 1/3 poly
- Spliced nylon/poly comb.
- 18% poly
- No loats or toggles

Gillnet Anchor to Bridle



- Anchor style:
 - Dansforth: 33%
 - RR rail: 40%
- Anchor line:
 - 3-6 fath.
 - as long as 20 fath.
- Anchor line material
 - 3/8 poly: 38%

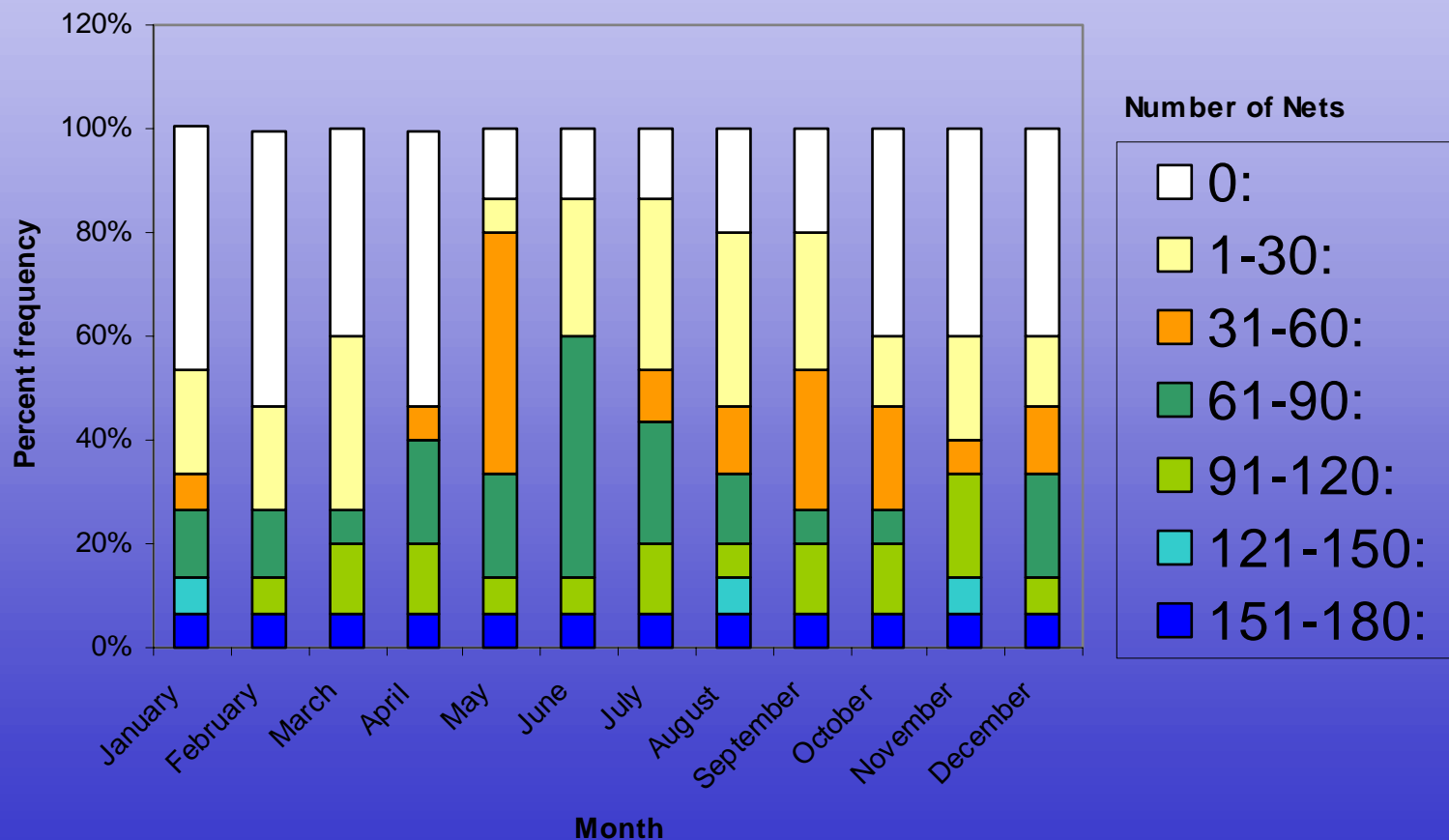
Gillnet Specifications



- Length of panel: 300'
 - 100%
- Floatline:
 - 5/16" to 1/2"
 - 5/16 poly with floats (stand up)
- Bridles:
 - tied together w/ double becket knot
 - space in between nets

Gillnet Effort

Percent frequency of numbers of nets fished by fishermen per month



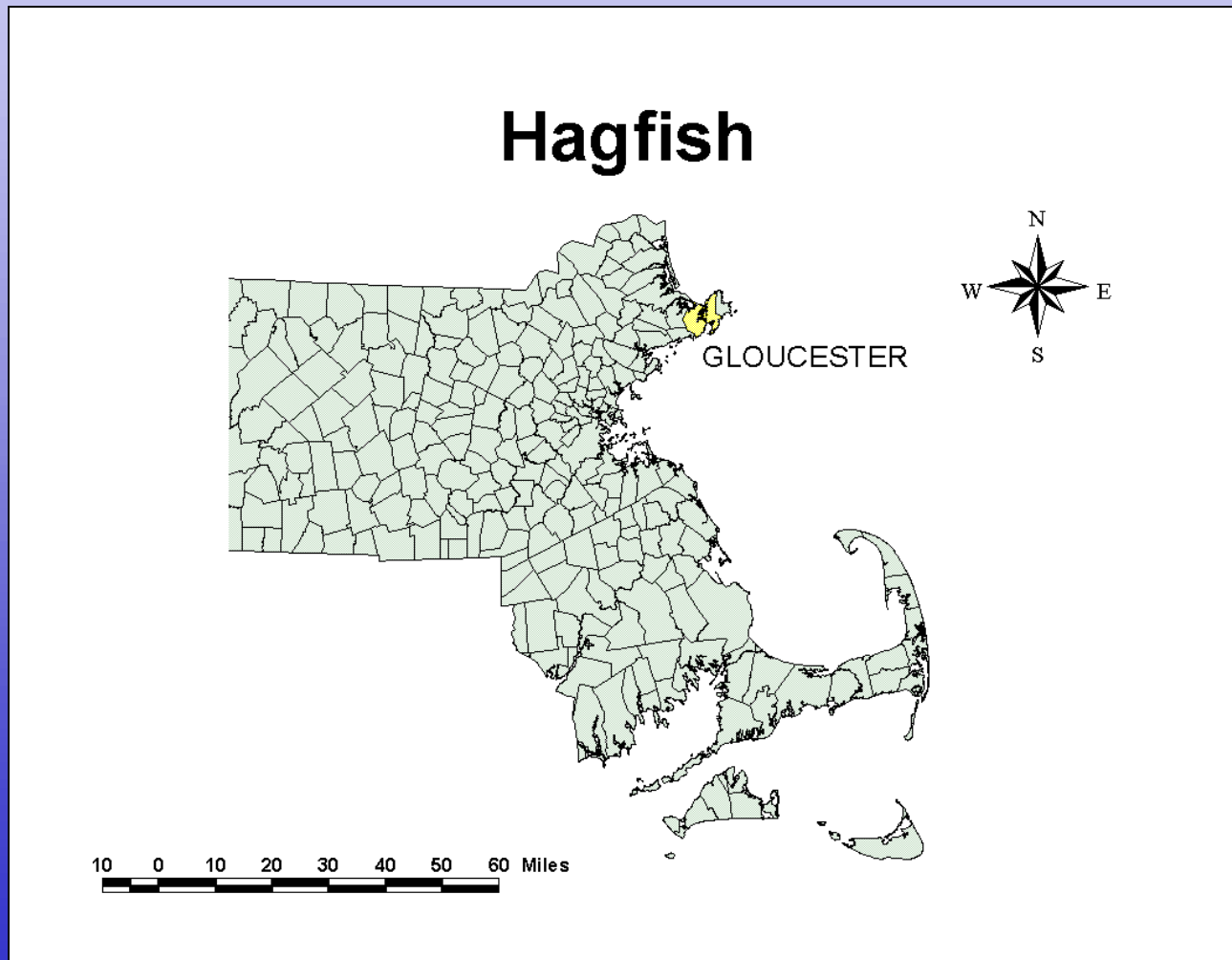
Weaklinks and Marine Mammal Deterrent Devices

- Pingers mandatory during fall, winter and early spring
- Spaces in panels as places for mammals to pass through
- Weaklinks:
 - Yes: 73%
 - Break Away Swivel: 47%

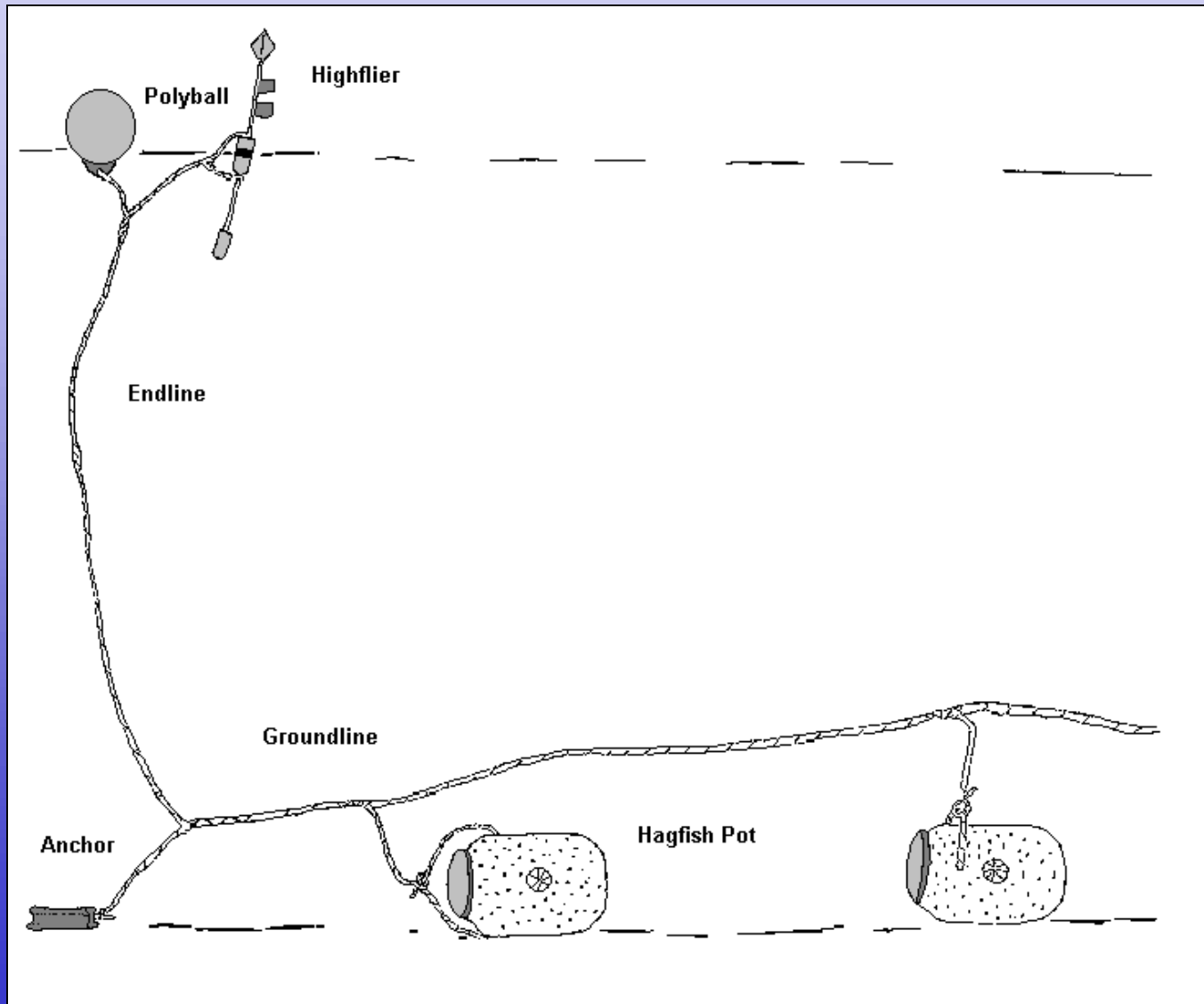
Hagfish Fishery

- **New Fishery 8+/- years old**
- **Processed in South Korea**
- **Skin and meat**
- **Meat now driving the market**
- **In order to handle hagfish, need freezing and cold storage**
- **Gloucester, Ma. hub of fishery**
- **Smaller boats fish in summer, larger boats fish year-round**
- **DMF interviewed 8 boats**

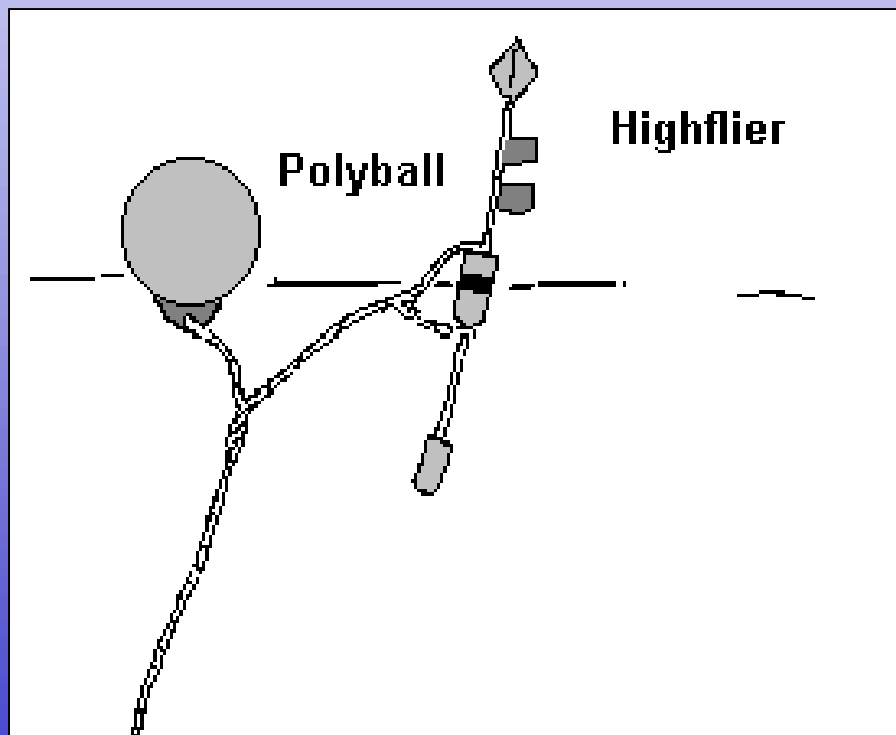
Hagfish Fishery - Ports Surveyed



Hagfish Gear

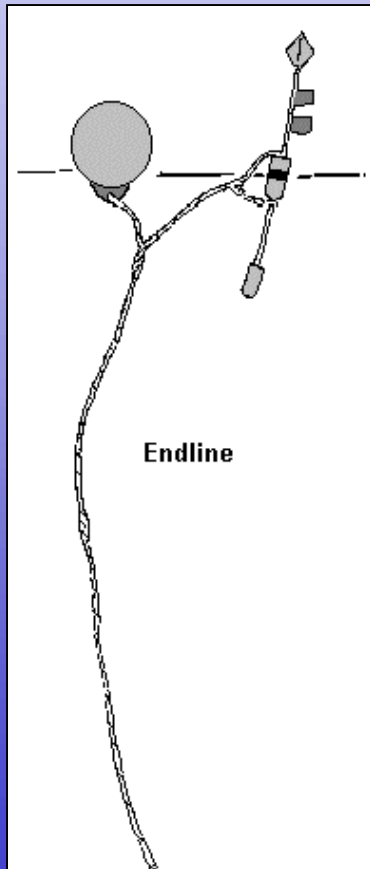


Buoys and Highfliers



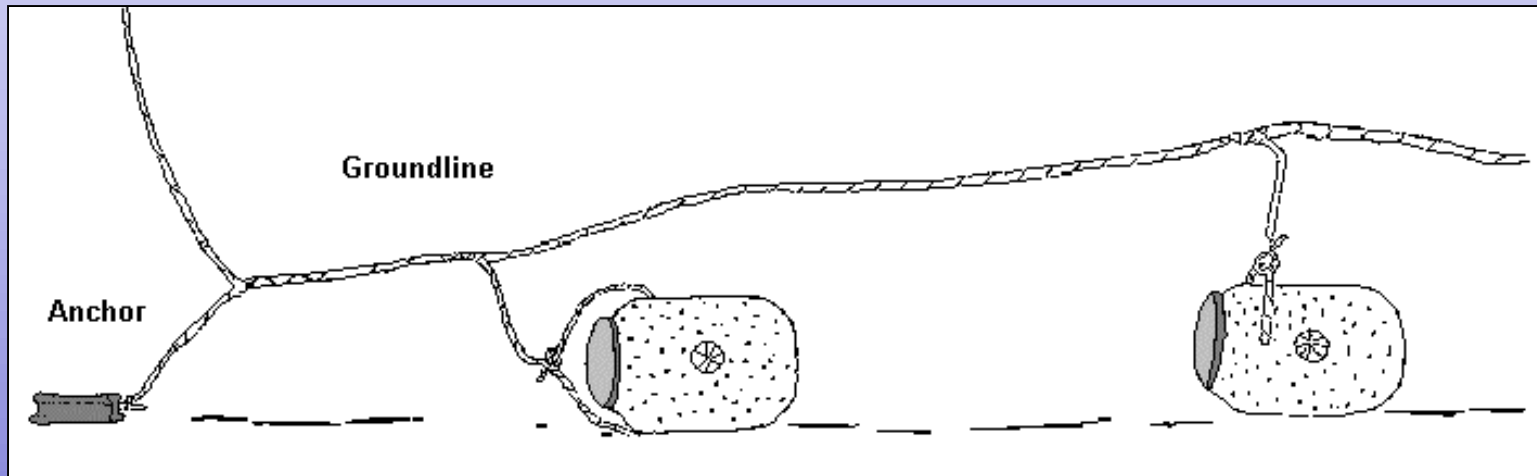
- Highflier/buoy comb. most common
- Buoy size
 - 9"x11"
- Polyball size
 - LD3 30"x14"
- Tag end to highflier
 - continuation on endline
 - distance highflier to buoy: 40' avg

Endlines



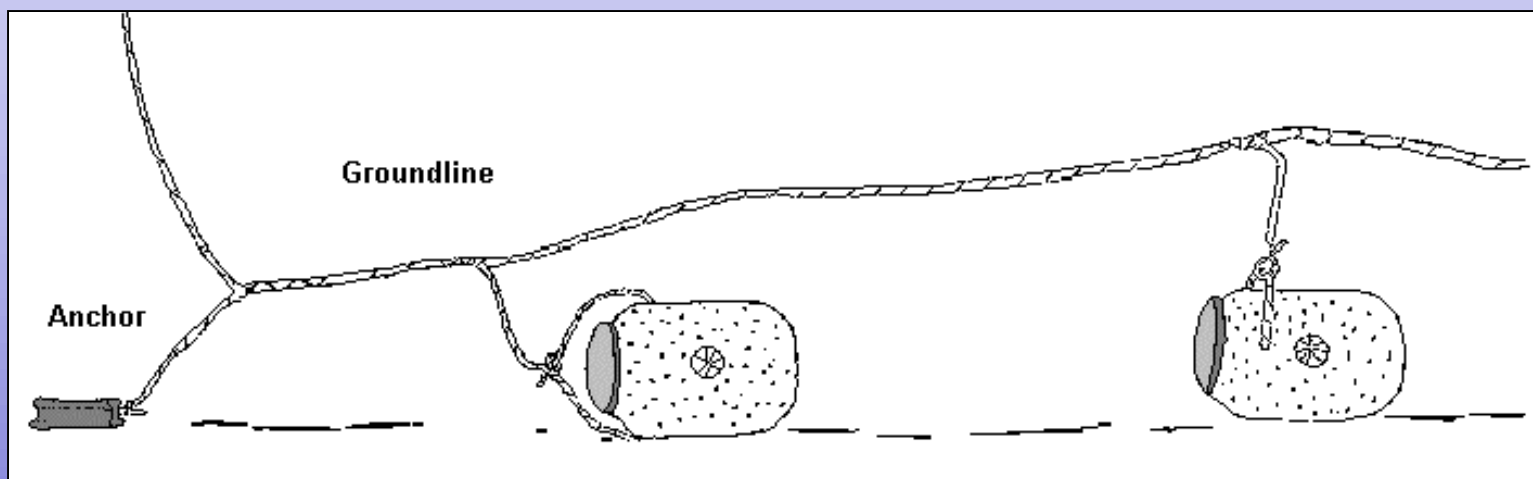
- Most boats used a comb. endline
 - 1/2" 1/3 nylon x 2/3 poly
- Diameter range
 - 3/8" to 5/8"
- Weaklinks used?
 - 50% of the time
 - break away swivel most common
- Re-attachment method?
 - Spliced: 56%

Anchors



- Anchor weights
 - Inshore concrete block / offshore RR track 5- 200lb
- Anchor line averaged 12' inshore / offshore 30'
 - 3/8 to 5/8 line attached w/a splice or knot
- 2 -3 anchors used per trawl

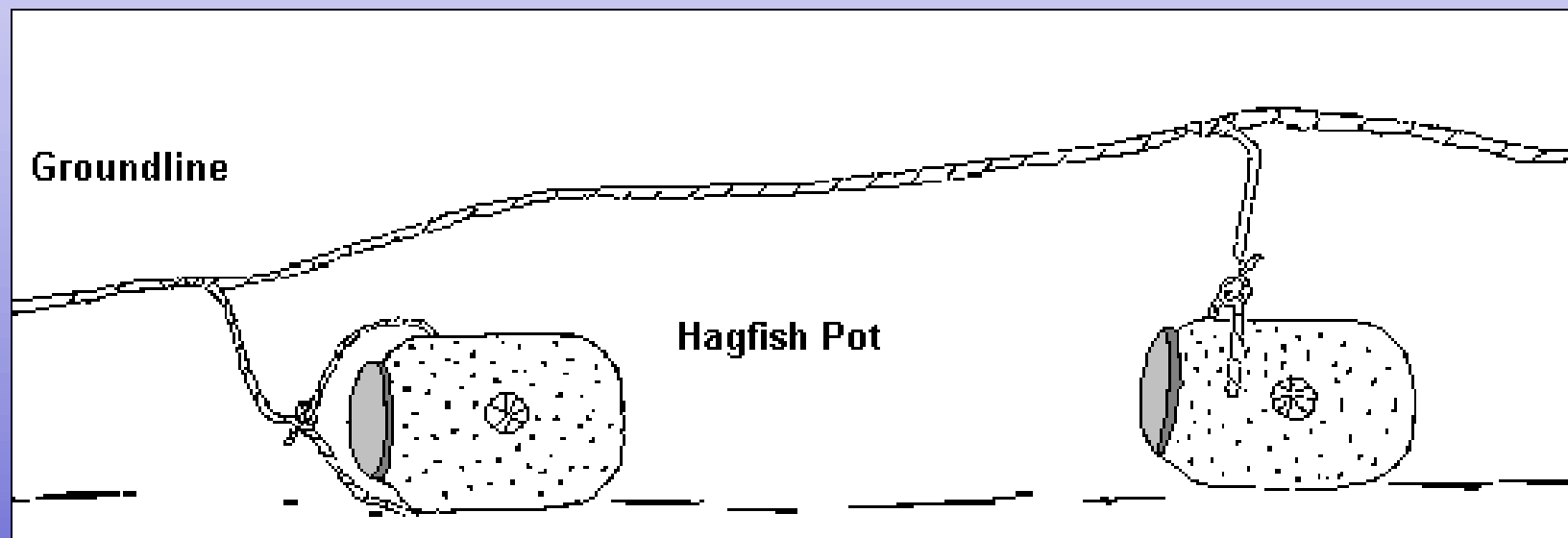
Groundline



- Length of trawl
 - 1800' inshore / 7200' offshore
- Material used inshore
 - 7/16" or 1/2" nylon
- Material used offshore
 - 3/8 to 5/8 nylon and poly

- Pots fished per trip
 - 80 to 144 pots
- Inshore 10 pot trawls were the most

Pot Characteristics

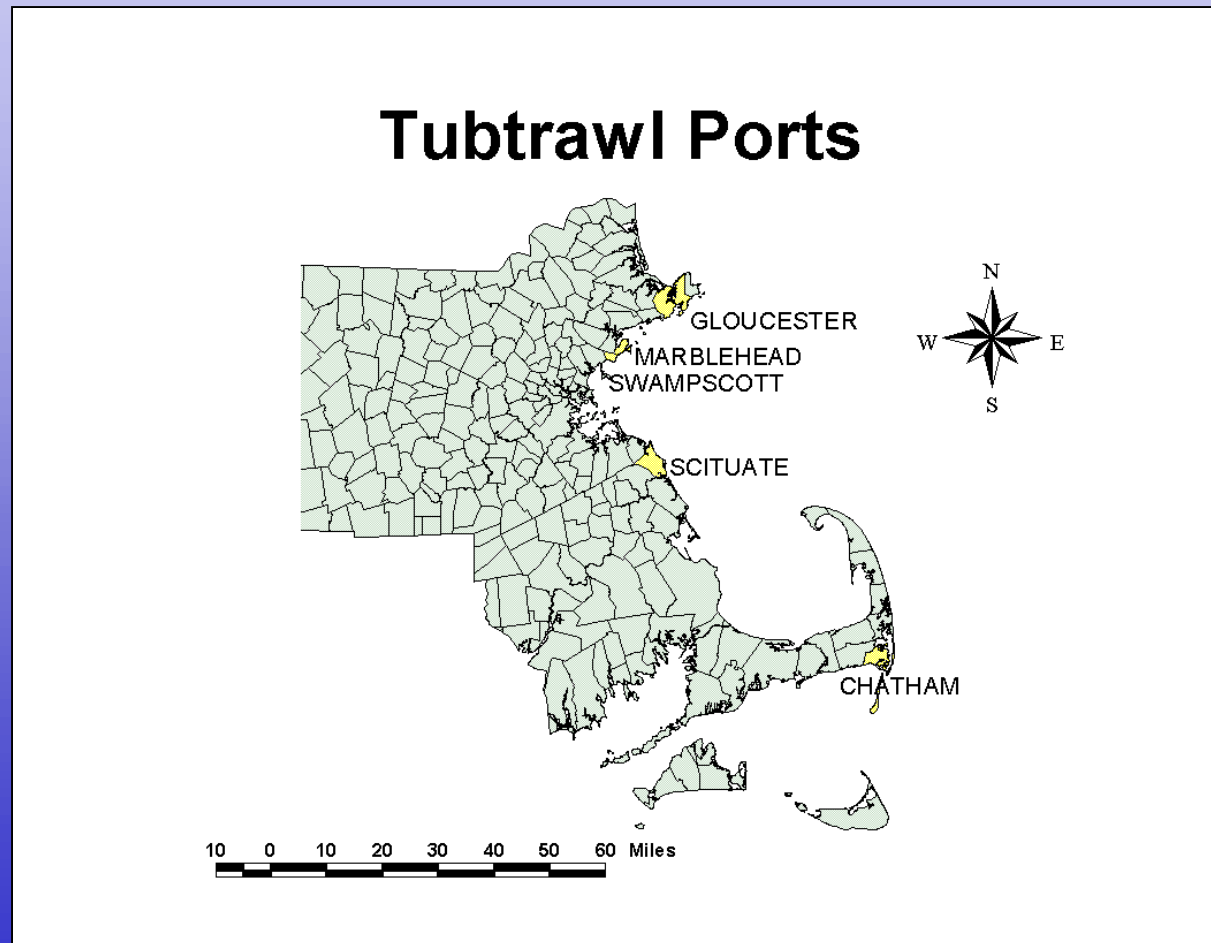


- Plastic barrels w/screw top
 - 5gal to 55gal / 45gal pickle barrel
- Average weight
 - 45 lbs use bricks, metal
- Baited loose / Herring most common
- Gangion
 - 3/8" to 5/8", avg 1 fm long
- Bridle
 - attached w/ double becket or becket w/tuck

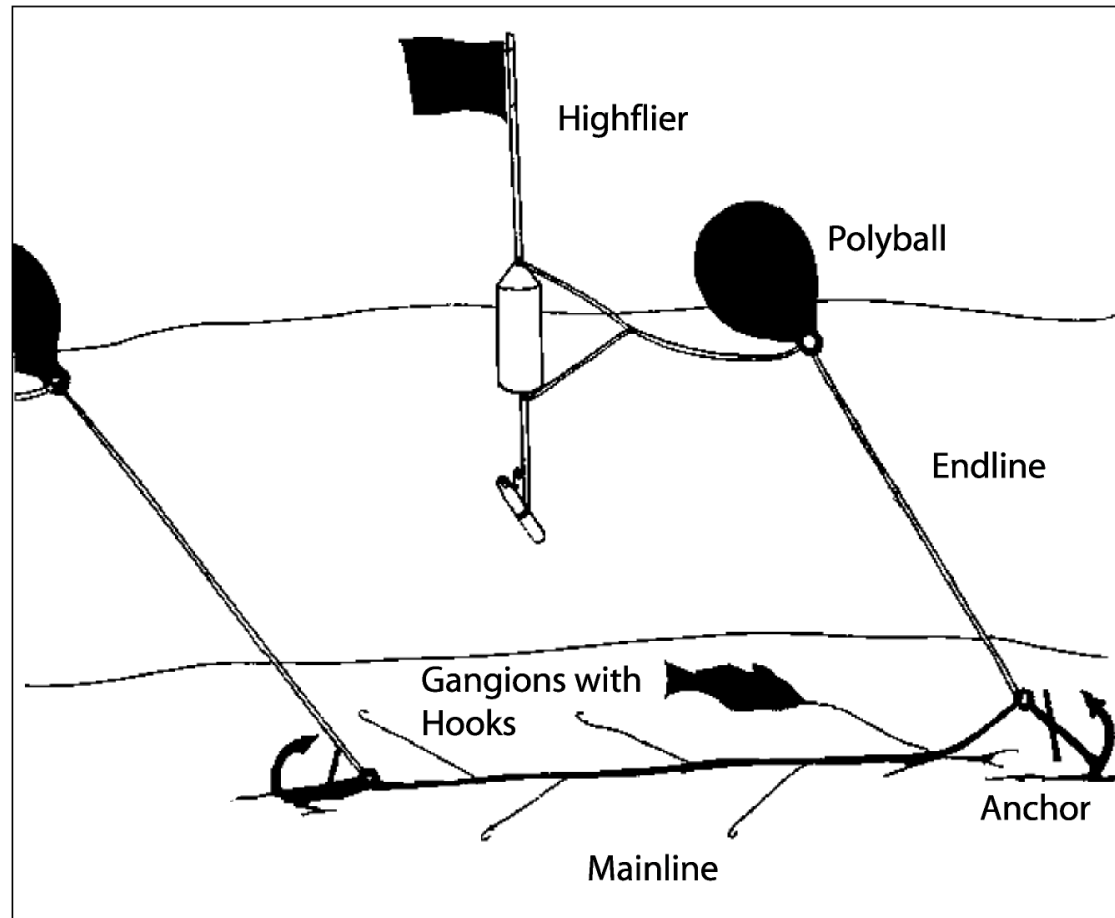
Tub Trawl

- One of the earliest methods used to target ground fish
- Used to target Spiny Dogfish, Cod, Pollock, Haddock
- Less financially viable, because of limits of fish allowed to land
 - Multispecies and Spiny Dogfish plans
 - Except south of 42 deg lat
- Interviewed 12 fishermen for survey

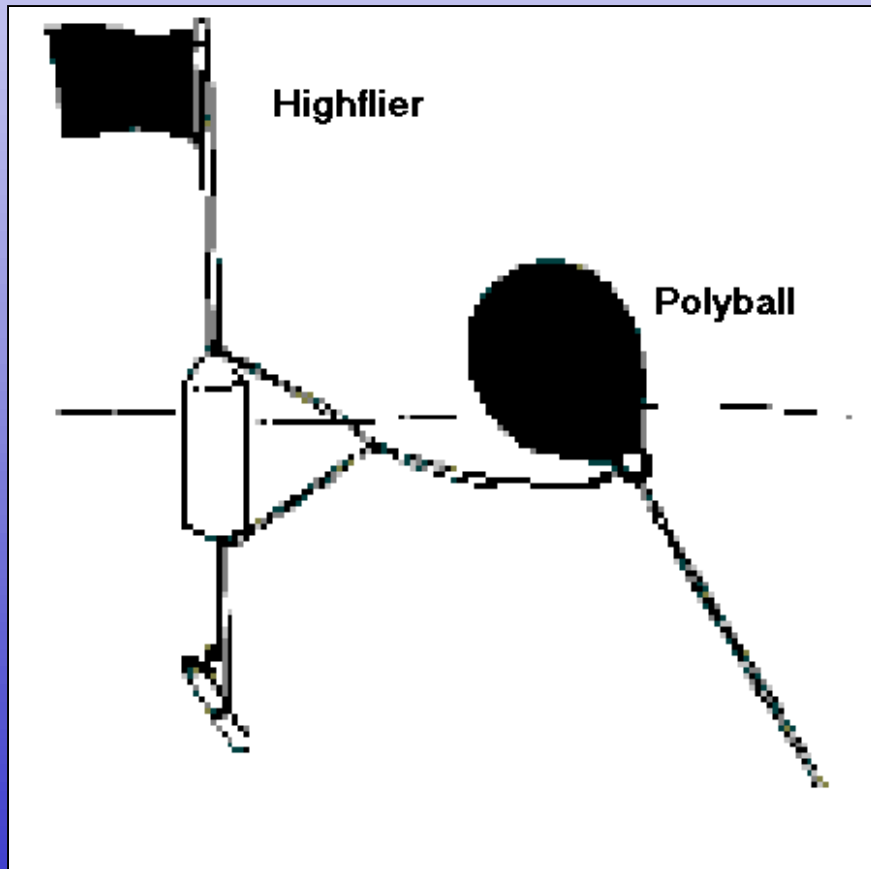
Tubtrawl Fishery - Ports Surveyed



Tubtrawl Gear

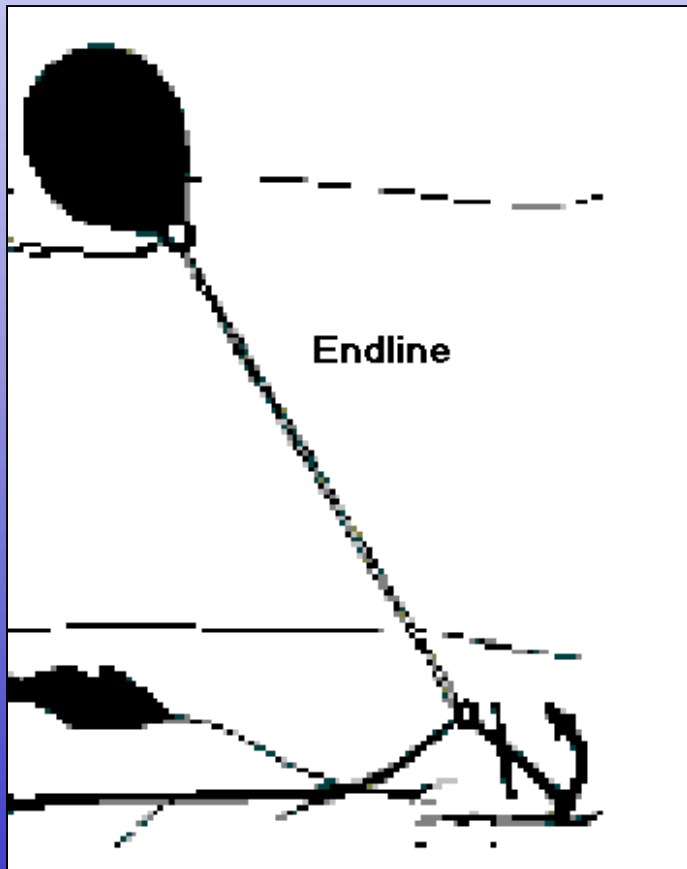


Buoys and Polyballs



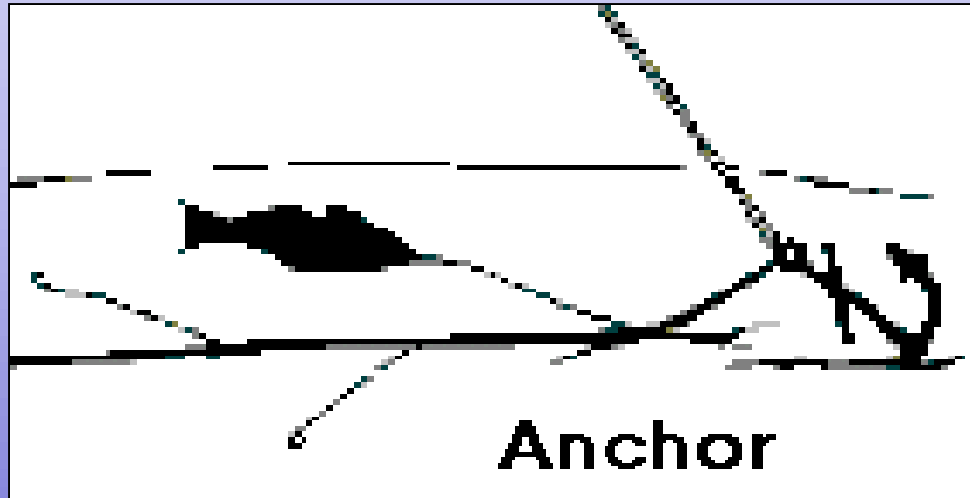
- Buoy?
 - Yes: 42%
 - 7"x15" most common
- Polyball?
 - Yes: 58%
 - 40" most common
- Highflier?
 - Yes: 67%

Endlines



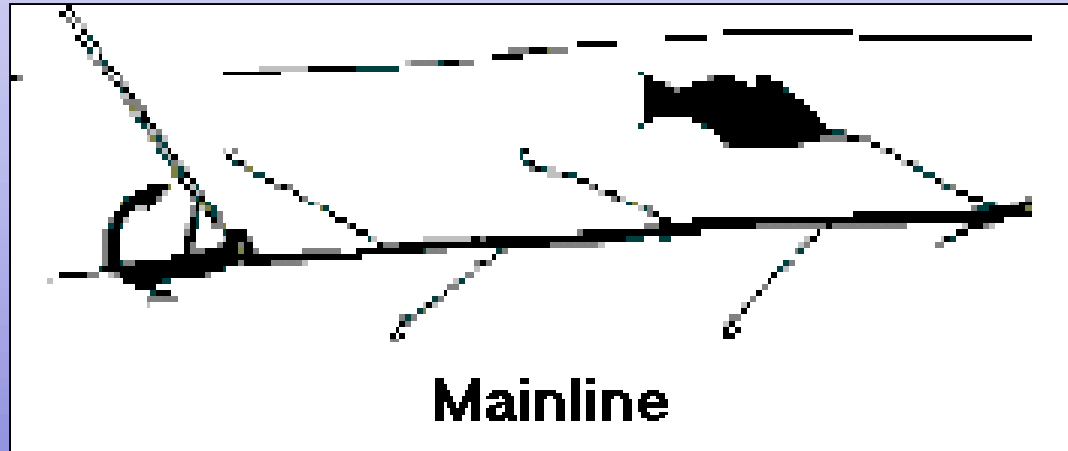
- Continuation of mainline
 - Parachute cord
 - 5/23, 8/32, 9/32
 - 3/8 1/3 nylon 2/3 poly
- Buoys and highfliers
 - clipped on w/ longline clip
- No weaklinks
- Breaking strength
 - 965lb - 1400lb

Anchors



- Used?
 - Yes: 100%
- Number used?
 - 2: 92%
- Window weights most common
- Weight?
 - 10lbs - 50lbs
- Bigger anchor for bigger tides
- Attached w/ longline clips

Mainline



- Material used?
 - 75% Parachute cord
- length of one tub?
 - Avg: 1500'
- breaking strength
 - 1010 - 1400
- Length of string
 - 1 - 5 tubs

Gangions and Hooks

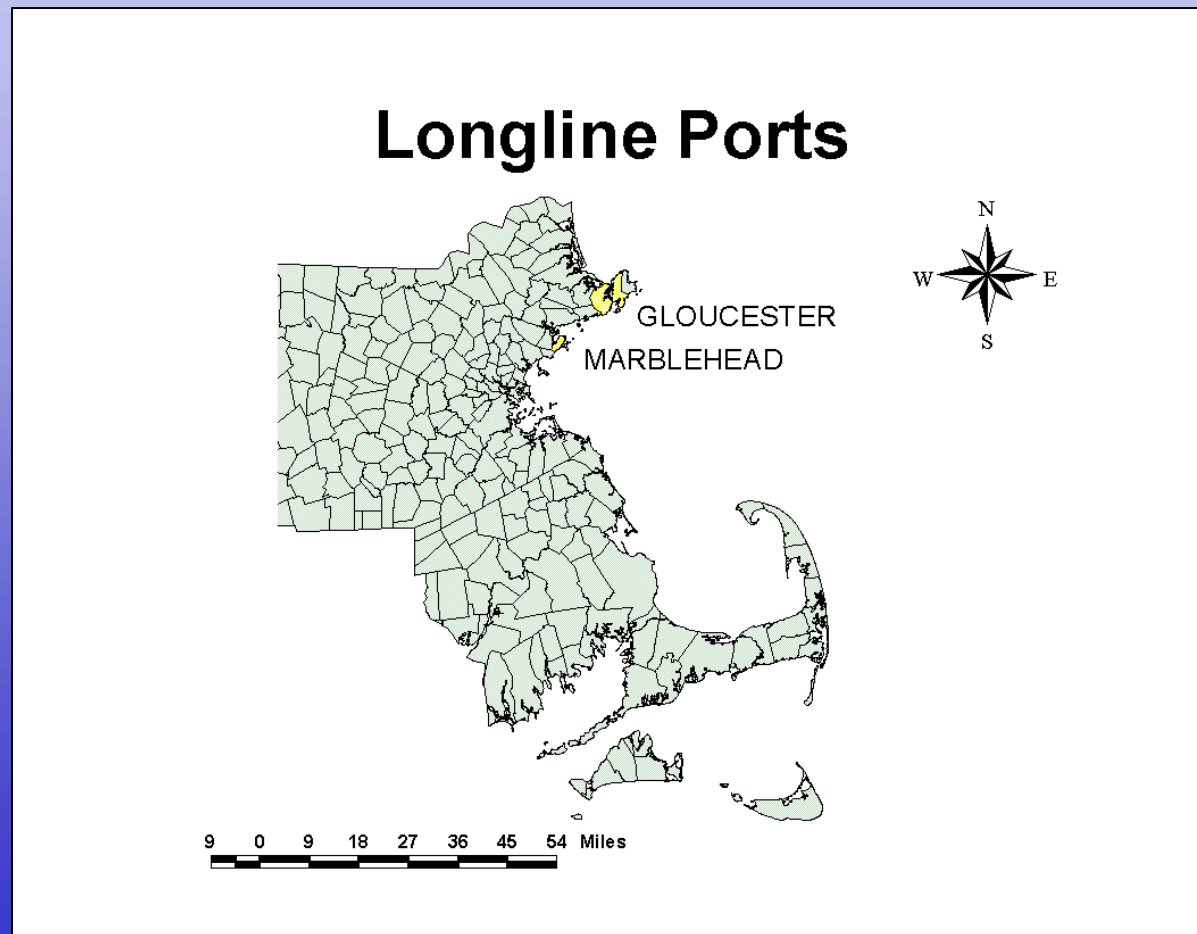


- Number of Gangions:
 - 100 - 500
 - 250 avg
- Diameter:
 - 550 thread 200 lb break
- Length:
 - 1' to 2'
- Distance between gangions
 - 3' - 9'
 - Most common 1 fathom
- Hooks
 - Mustad: 83%
 - circle: 71%
 - size: 12/0

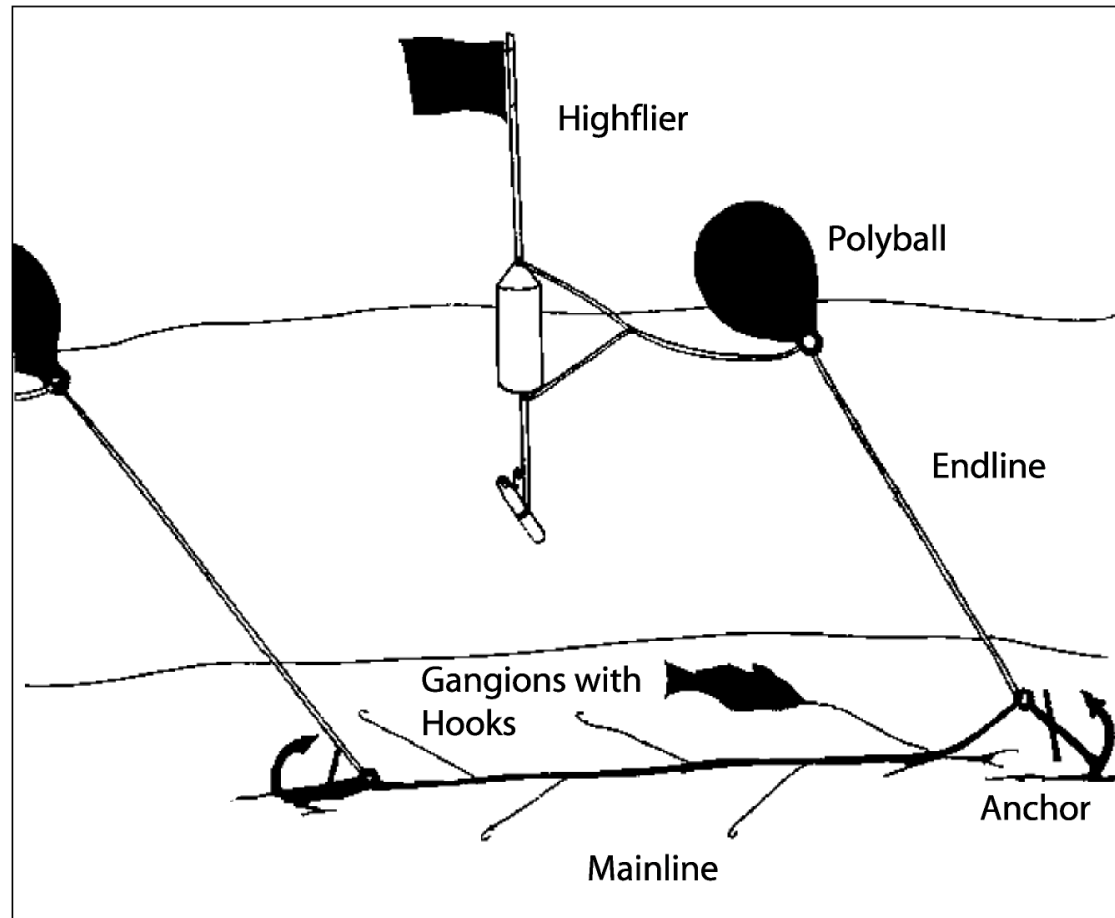
Longline

- Very similar to Tubtrawl
- Target same species, fish same bottom
- Due to current Multispecies and Spiny Dogfish regulations, less financially viable
- Surveyed 4 fishermen

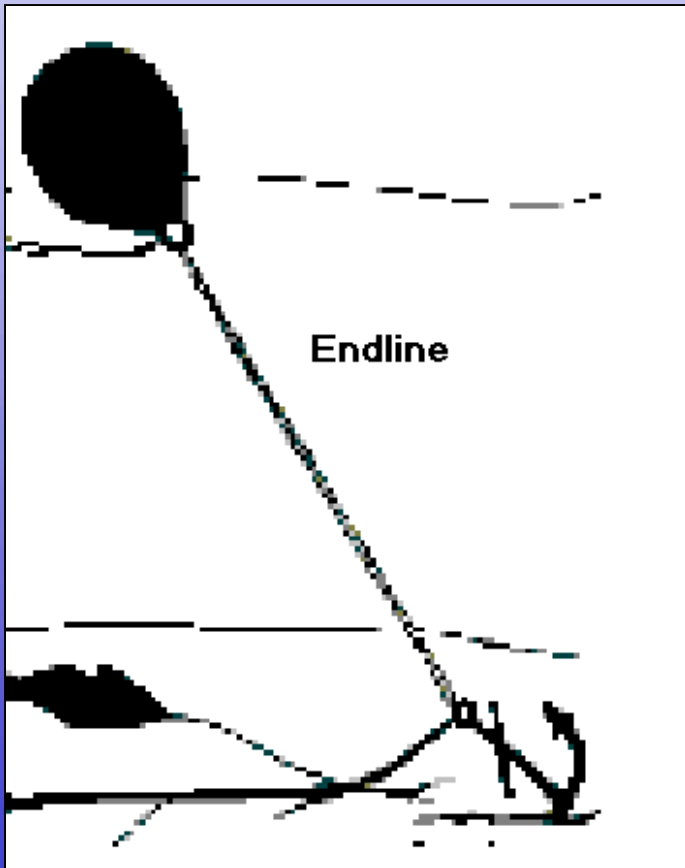
Longline Fishery - Ports Surveyed



Longline Gear

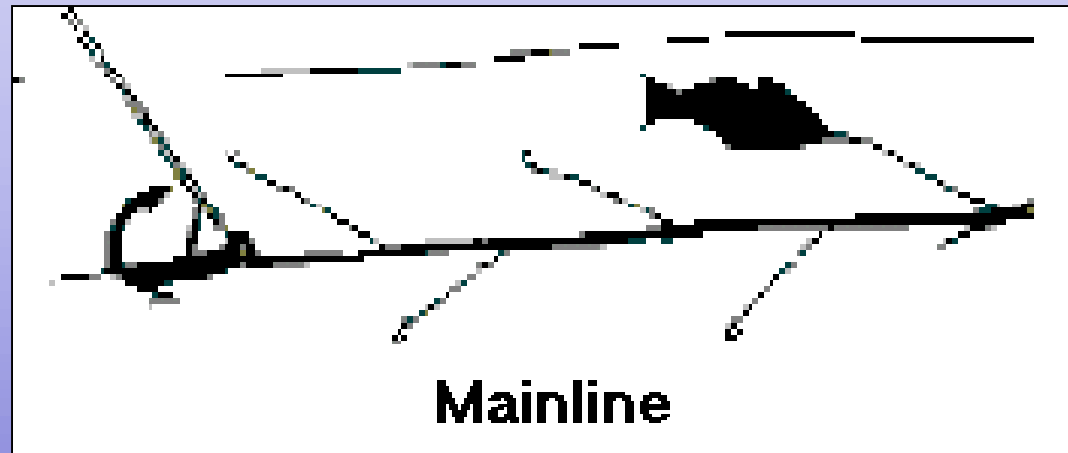


Endlines



- Material same as mainline
 - 75% use parachute cord
 - 7/32" to 8/32"
- Breaking strength
 - Not < 1100 lbs

Mainline and Anchor



- 1 to 6 nautical miles long
- Parachute cord
- Anchors
 - Window weights snapped on periodically
 - 50% trawl anchor on ends

Gangions and Hooks



- Material:
 - Monofilament: 100%
- Length:
 - 2'
- Dist. Between gangions:
 - 5' - 30'
- Hooks:
 - Mustad 100%
 - Circle 100%
- Size:
 - 12/0 50%
 - 13/0 50%